on the very satisfactory form in which the memoir appears. The arrangement of the material, the typography and the character of the illustrations are all worthy of favorable comment. JOHN C. MERRIAM.

SCIENTIFIC JOURNALS AND ARTICLES.

THE contents of the April number of the *American Journal of Mathematics* are as follows:

HENRY LEWIS RIETZ: 'On Primitive Groups of Odd Order.'

A. N. WHITEHEAD: 'Theorems on Cardinal Numbers.'

T. J. I'A BROMWICH: 'The Caustic, by Reflection, of a Circle.'

HARRY WALDO KUHN: 'On Imprimitive Substitution Groups.'

THE *American Journal of Psychology* for January contains the following articles:

W. P. MONTAGUE: 'A Theory of Time-Perception.'

BENJAMIN RICHARDS ANDREWS: 'Auditory Tests.'

E. B. TITCHENER: 'Some New Apparatus.'

I. M. BENTLEY and E. B. TITCHENER: 'Ebbinghaus' Explanation of Beats.'

C. SPEARMAN: 'The Proof and Measurement of Association Between Two Things.'

I. M. BENTLEY: 'Professor Cattell's Statistics of American Psychologists.'

THE first number of the *Journal of Comparative Neurology and Psychology* as recently reorganized appears in March with contents as follows: 'The Relation of the Motor Endings on the Muscle of the Frog to Neighboring Structures,' by John Gordon Wilson. A description with illustrations of the motor nerve endings with special reference to the ultra-terminal fibrils and the relation of the ending to the sarcolemma. 'Space Perception of Tortoises,' by Robert M. Yerkes. A quantitative study of the amount of hesitation exhibited by different species of tortoises before crawling over the edge of an elevated board and correlation of these data with the natural habits of the species studied. 'A Note on the Significance of the Form and Contents of the Nucleus in the Spinal Ganglion Cells of the Fœtal Rat,' by Shinkishi Hatai. A cytological examination of developing spinal ganglion cells to determine the functional significance of the centrosome, aster and Nissl granules and their relations to the nucleus, illustrated by two plates. 'An Establishment of Association in Hermit Crabs,' by E. G. Spaulding. A demonstration that the hermit crab is capable of profiting relatively rapidly by experience. Editorials, a summary of the neurological papers read at the mid-winter meetings and reviews complete the number.

THE March number of the *Botanical Gazette* contains a contribution from John F. Garber on 'The Life History of *Ricciocarpus natans*,' the investigation having resulted in a very complete morphological study, to which are appended biological data derived chiefly from observation of the plant in the field during one season and from experimental work in the laboratory.—Mabel L. Merriman publishes the results of her long study of 'Vegetative cell division in *Allium*,' this being one of the few complete studies of karyokinesis in vegetative cells of plants.—John Donnell Smith publishes his twenty-fifth paper entitled 'Undescribed plants from Guatemala and other Central American republics.'—Charles Thom describes *Craterellus taxophilus* as a new pecies of Thelephoraceæ.—J. M. Greenman publishes notes on the indigenous Centaureas of North America, describing one new species.—W. J. Beal makes another contribution to the vitality of seeds.

SOCIETIES AND ACADEMIES.

THE AMERICAN PHILOSOPHICAL SOCIETY.

THE general meeting of the society will be held on April 7, 8 and 9, in the hall of the society in Independence Square (104 South Fifth Street), Philadelphia.

Morning sessions, 10:30 A.M. to 1 P.M. Afternoon sessions, 2 to 4:30. Luncheon will be served in the rooms of the society from one to two o'clock. A reception will be given to the members and the ladies accompanying them at the Free Museum of Science and Art of the University of Pennsylvania on Thursday evening, April 7. The visiting members will be the guests of the resident members of

the society at dinner on Friday evening, April 8. The University Club, 1510 Walnut Street, extends the courtesies of its house to the visiting members during their stay in Philadelphia.

The preliminary program is as follows:

Dr. Charles Conrad Abbott, of Trenton, N. J.: 'On the Occurrence of Artifacts Beneath a Deposit of Clay.'

Dr. Charles Conrad Abbott, of Trenton, N. J.: 'On the Breeding Habits of the Spade Foot Toad (*Scaphiopus solitarius*).'

Professor L. H. Bailey, of Ithaca, N. Y.: 'Summary of the Recent Movements to Teach Agriculture in the Schools.'

Professor Carl Barus, of Providence, R. I.: 'Atmospheric Nucleation.'

Dr. Franz Boas, of New York: 'The Horizontal Plane of the Skull.'

Dr. Aristides Brezina, of Vienna: 'On the Collecting of Meteorites.'

Professor William Keith Brooks, of Baltimore: '*Doliolum* and *Scalpa*.'

Professor William W. Campbell, of Mt. Hamilton, Cal.: 'On the Spectra and General Nature of Temporary Stars' (with lantern slide illustrations).

Professor Edwin Grant Conklin, of Philadelphia: 'The Organization of the Germ Cells and Its Bearings on Evolution.'

Professor Charles L. Doolittle, of Philadelphia: 'The Reflex Zenith Tube.'

Mr. Eric Doolittle, of Philadelphia: 'Faint Double Stars.'

Dr. Charles B. Dudley, of Altoona, Pa.: 'A System of Passenger Car Ventilation.'

Professor John B. Hatcher, of Pittsburg, Pa.: 'An Attempt to Correlate the Marine with the Fresh and Brackish Water Mesozoic Formations of the Middle West.'

Professor Paul Haupt, of Baltimore: 'Biblical Pessimism.'

Professor Angelo Heilprin, of Philadelphia: 'Pompeii and Saint Pierre: an Examination of the Plinian Narration, and Other Studies' (with lantern slide illustrations).

Professor Waterman T. Hewett, of Ithaca, N. Y.: 'The Use of the Relative Pronouns in Standard English Writers.'

Waldemar Jochelson, of New York: 'The Yukaghis Language.'

Professor H. F. Keller, of Philadelphia: 'Dimethyl Racemic Acid, Its Synthesis and Derivatives.'

Professor Henry Kramer, of Philadelphia: 'The Origin and Nature of Color in Plants.'

Professor Preston A. Lambert, of Bethlehem, Pa.: 'The Expansion of Algebraic Functions at Singular Points.'

Professor Marion D. Learned, of Philadelphia: 'Results of the American Ethnographical Survey.'

Professor LeRoy W. McCay, of Princeton: 'Trisulphoxyarsenic Acid.'

Professor John Marshall, of Philadelphia: 'The Constituents of the Venom of the Rattlesnake.'

Professor Otis T. Mason, of Washington: 'The Ripening of Thoughts in Common.'

Dr. Charles A. Oliver, of Philadelphia: 'Regulation of Color-Signals in Marine and Naval Service.'

Professor A. H. Phillips, of Princeton, N. J.: 'Radium from American Ores.'

Professor Albert B. Prescott, of Ann Arbor, Mich.: 'The Rôle of Carbon.'

Professor Theodore W. Richards, of Cambridge, Mass.: 'Sources of Error in the Determination of the Atomic Weight of Nitrogen.'

Professor Felix E. Schelling, of Philadelphia: 'The Pedigree of Elizabethan Drama.'

Professor William B. Scott, of Princeton, N. J.: 'The Miocene Rodentia of Patagonia.'

Professor Edgar F. Smith and Mr. F. F. Exner, of Philadelphia: 'The Atomic Weight of Tungsten.'

Mr. Gilbert van Ingen: 'The Silurian Fauna of Arkansas.'

Mr. Joseph Wharton, of Philadelphia: 'Palladium.'

THE AMERICAN PHYSICAL SOCIETY.

The February meeting of the Physical Society was held in New York on February 27. For the first time since the famous address of Rowland in 1899 the society had the pleasure of listening to a presidential address, Professor Webster's subject being 'Some Practical Aspects of the Relations between Physics and Mathematics.' The address was delivered before a joint session of the Physical Society and the Mathematical Society. It will be published in full both in Science and with the 'Proceedings of the Physical Society' in the *Physical Review*.

Upon the recommendation of the council certain amendments to the by-laws were adopted whose purpose was twofold, viz.: (1) to

make possible the election of *associate members* as well as regular members; (2) to establish, for regular members, an entrance fee of three dollars.

The council was led to recommend such action because of its desire to extend the advantages of membership in the Physical Society to a larger number of persons, and at the same time to maintain a distinctly high scientific standard in the case of the regular membership. In the past the effort to accomplish both of these two aims has sometimes led to considerable embarrassment, both to the council and to members making nominations.

The policy of the council will hereafter be to elect to regular membership in the society only such persons as have contributed to the advance of physics by investigation of a serious character. Those who have been prevented from carrying out work of investigation, but who are otherwise desirable as members of the society, will be eligible for election to associate membership. Associate members will have all the privileges of membership except that they may not vote nor hold office. They will, for example, receive the two publications now furnished by the society to its members. Associate members may be transferred to regular membership by action of the council whenever they have completed research work of such character as to warrant such transfer. It is not the policy of the council to make election to associate membership a mere formality for any who may desire it. On the contrary, there is a strong feeling that the society would best accomplish its object in 'promoting the advance and diffusion of the knowledge of physics' by maintaining a high standard for both regular and associate membership.

The spring meeting of the society will be held in Washington, on Friday, April 22, and Saturday, April 23, 1904. Sessions for the presentation of papers will be held on Friday from 2 P.M. to 5 P.M., and on Saturday from 10 A.M. to 1 P.M. On Friday at 6 P.M. there will be an informal dinner, and later in the evening a lecture upon a subject to be announced later. On Saturday, at 1 P.M., a luncheon by the Philosophical Society of Washington, complimentary to the Physical Society. Saturday afternoon an excursion to the Bureau of Standards and the Weather Bureau. The arrangement of further details regarding the meeting is in the hands of a committee of the Philosophical Society of Washington, at whose invitation the meeting is held in that city.

Brief abstracts of the papers read at the February meeting are given below.

The Conduction of Electricity in Mercury Vapor: A. P. WILLS.

This paper gave the results of an extended study of the mercury vapor lamp carried out in the Hewitt laboratory during the past year. The measurements had especial reference to the electromotive intensity in the positive column. It was found possible to develop an empirical formula representing with great accuracy the dependence of the potential gradient upon current, pressure and diameter of tube. The drop at the anode, usually about seven volts, was found to rise under abnormal conditions as high as fifteen volts. The drop at the kathode was about five volts.

Experiments Showing the Action of a Magnet upon the Mercury Arc: PETER COOPER HEWITT.

Several very interesting experiments with a large mercury vapor lamp were shown by Dr. Hewitt. The action of a magnet upon the positive column seemed to be about the same as in an ordinary vacuum tube. The effect upon the brilliant spot of light, or flame, at the kathode was especially interesting. When the lamp was in a rather strong field a luminous bundle of rays was seen to proceed from the bright spot on the kathode surface, following a path that was the same as that of the lines of force of the field.

Microphotography of Fog Particles and the Photographic Study of Atmospheric Nucleation: CARL BARUS.

The author gave a description of his apparatus and methods, and illustrated the results by a series of ten lantern slides and many positives showing the microphotographs of fog particles. Most of these were strikingly distinct, the water globules ranging in size from

about .0002 cm. to .002 cm., according as fogs of different degrees of fineness were precipitated. The most highly graded nuclei, as shown by the presence of fog particles of all sizes, were obtained from an exposure of dust-free air to the X-rays for from one to ten minutes, depending on the intensity of radiation. Much greater uniformity is shown in the cases of phosphorus and ordinary air nuclei.

The author described a number of curious phenomena observed with these water particles, among which their continued motion when caught on a film of liquid oil, simultaneously to and fro between edges of the film, is most noteworthy. Particles moving in swarms in opposed directions are often in the focus of the microscope together, and thus lie very nearly in the same plane. The author finally remarked that the coronal method had now been so far perfected that the nucleation increment produced by a single gas flame in a moderately large lecture room could be detected in about ten minutes, even in the air collected from near the floor. This favorable quantitative result may then be supplemented qualitatively by the photographic method, which will show the presence of exceptionally small or large particles, whose effect vanishes from the corona as they are relatively few in number.

Preliminary Measurements of the Short Wave-lengths Discovered by Schumann: THEODORE LYMAN.

The measurements were made with a concave grating ruled on speculum metal, which was found to reflect the extremely short waves used in considerable intensity. All work was carried on in an atmosphere of hydrogen and at low pressures. Numerous lines were found in the spectrum of hydrogen lying well beyond the aluminum group at 1,854. The shortest wave-length thus far measured by Dr. Lyman was 1,206 Angström units. This lies far beyond the region where wave-lengths have previously been *measured.* Dr. Lyman is certainly to be congratulated upon the success of these distinctly difficult measurements. The present communication is merely preliminary.

The Hall Effect in the Electric Arc: C. D. CHILD.

If two carbon pencils are so placed in an arc that there is little or no potential difference between them, a potential difference is produced by creating a magnetic field about the arc. This may be as high as 1.5 volts. It appears to be similar to the Hall effect in metals, and if it is this effect, it would show that the negative ions have a velocity enormously greater than that of the positive.

Salts placed in the arc which diminish the drop of potential at the anode also diminish the effect here studied. With KNO_3 the anode drop becomes as small as that at the cathode and the potential difference between the two pencils became approximately zero. When the pressure is reduced to about 1 cm. the effect also disappears.

No definite explanation of the phenomenon can at present be given. It appears, however, to be a more complicated effect than the ordinary Hall effect in metals.

Some Further Observations on the Radiation Produced in an Alternating Condenser Field: FERNANDO SANFORD.

The author has continued the experiments described in the December number of the *Physical Review,* where it was found that certain photographically active rays are given off by a plate connected to the *negative* pole of an induction coil, even when no visible discharge occurs. It has now been found possible to measure the wave-length of these rays by means of a grating. Values are found ranging from 350$\mu\mu$ to 377$\mu\mu$, depending upon the metal of the kathode. The rays, therefore, lie in the ultra-violet just beyond the edge of the visible spectrum.

ERNEST MERRITT,
Secretary.

THE GEOLOGICAL SOCIETY OF WASHINGTON.

THE 151st meeting was held on February 10, 1904.

A topographic model of Alaska made by Mr. Edwin E. Howell was exhibited and was briefly described by Mr. Alfred H. Brooks.

This model of Alaska, which is to form a part of the Geological Survey exhibit at the

Louisiana Purchase Exhibition, is based, for the most part, upon the topographic surveys made during the past six years by the Geological Survey parties. The coast line is taken from the charts of the Coast and Geodetic Survey. The base map, which was also exhibited, was compiled by Mr. E. C. Barnard, under the direction of the late Mr. R. U. Goode, and the scale of both the model and the map is forty miles to the inch. In the model the vertical scale has been exaggerated five times, while on the map the contour interval is 1,000 feet. This map represents the first attempt to show the relief of Alaska by contours. While much of it will be subject to revision by future surveys, it is believed that in its present form it is of a sufficient degree of accuracy to be worthy of publication and that it correctly represents the larger geographic features of the territory.

The coloring of the model is intended to indicate, in a broad way, the distribution of timber, as well as that of the ice and snow. Many will be surprised to find what a small part of Alaska is covered with perpetual snow and that the glaciers are practically confined to the coastal mountains of Alaska. It will be noted that the heavy timber is limited to the Pacific coastal belt of Alaska, east of Kodiak Island, and to the immediate vicinity of the larger rivers of the Yukon Basin. Above the timber line, which in southeastern Alaska is between 3,000 and 4,000 feet, and in the northern part of the territory descends to about 1,000 or 1,200 feet, are broad areas which are entirely devoid of forests. The attempt has been made on the model to represent this treeless region by colors suggestive, at least, of vegetation.

Besides this high timberless belt there are other large areas of regions of relatively low relief, which are also devoid of timber. These are the coastal plains, which stretch from the Alaskan Peninsula northerly to the Arctic, and thence sweeping around to the north of the Rocky Mountains, extend eastward to the McKenzie. This so-called *tundra* is a part of the great zone which encircles the polar regions. It is devoid of timber except for the dense growth of willow which is found along many of the sheltered stream valleys.

Alaska includes an area of about 570,000 square miles, about one fifth of the area of the United States, and two thirds of the region included in the Louisiana Purchase. The shape is irregular and consists of a large compact body of land, with projections to the southeast and southwest, the former called the Panhandle, or southeastern Alaska, and the latter the Alaskan Peninsula. The peninsula is extended to the westward by the Aleutian Chain, to where it is met by the Commander Islands, a somewhat similar easterly extension from the Peninsula of Kamchatka.

The Pacific and southern Bering Sea coast of Alaska exhibits unusual irregularity of form, including many islands and many fiords which penetrate the mainland. The arctic and northern Bering Sea coast line is much more regular, and is characterized by shoal water conditions and straight shore lines. The relief of Alaska exhibits a wealth of contrasting variety in mountains and valleys, plateaus and lowlands, which are developed on a truly grand scale. Broadly speaking, the larger features of topography correspond with those of the western United States. There is a Pacific Mountain system separated from the Rocky Mountain system to the north by a Plateau Region, and north of the Rockies lies a plains region, forming the Arctic Slope Province.

The Pacific Mountain system includes four ranges, the Coast, the St. Elias, the Aleutian and the Alaskan. The highest points in northwestern America and also on the continent lie within these ranges, and are Mount St. Elias, 18,080; Mount Logan (Canada), 19,500, both in the St. Elias Range; and Mount Foraker, 17,000, and Mount McKinley, 20,300, the two latter in the Alaskan Ranges.

Less is known of the Rocky Mountain system, which extends through the Yukon territory, and upon approaching the Arctic coast bends westward. To the west it is divided into two ranges separated by the valley of the Kobuk River. Between the two mountain systems lies the province which has been called the Plateau Region. This is char-

acterized by broad, flat-topped inter-stream areas, whose summits mark a well-defined plain. The Arctic Slope Region includes a small area lying north of the Rocky Mountains.

The model shows not only the relief, but also the distribution of the timber and the mineral deposits, as far as they have been determined. It will be noted that the gold placers have a very wide distribution through Alaska, that copper has been found only in the Pacific Mountain belt, tin at the western end of the Seward Peninsula, while coal has been found in many widely separated localities. The lode mines which have been developed up to the present day are practically all confined to the Pacific Coastal belt.

Mr. George B. Shattuck then presented a paper on 'Recent Elevations and Depressions in the Bahama Islands,' illustrated by stereopticon. This paper was based on the results of the expedition sent out by the Geographical Society of Baltimore, and will soon be published in full.

A third paper, by Mr. G. K. Gilbert, had for its subject, 'Domes and Dome Structures in the Sierra Nevada,' and is now in print as a bulletin of the Geological Society of America.

Alfred H. Brooks,
Secretary.

BIOLOGICAL SOCIETY OF WASHINGTON.

The 383d regular meeting of the society was held on Saturday evening, March 5, 1904. Dr. A. K. Fisher delivered an illustrated lecture on the 'Birds of Laysan Island,' based on observations made by W. K. Fisher, of Stanford University, during the summer of 1902, while connected with the U. S. Fish Commission steamer *Albatross*. Laysan Island, which lies in the Pacific, about 800 miles northwest of Honolulu, is one of the most remarkable bird islands in the world. It is the home of countless thousands of sea birds, such as albatrosses, terns, gannets, frigates, shearwaters, petrels, etc., and has rarely been visited by naturalists. A most detailed account of the bird population of the island was given. The photographs shown constitute one of the most interesting series of bird pictures ever taken.*

Mr. J. N. Rose exhibited some fifty water-color drawings to illustrate the genera of Crassulaceæ recently segregated by Dr. N. L. Britton and himself. The drawings are the work of Mr. F. A. Walpole and have been executed with great skill. Mr. Rose pointed out the fact that the number of genera in Crassulaceæ as compared with the number of species is very small, and that nearly all the species of the world are to be found in six genera. He states that complaint is often made that the generic limits are very indistinct which he thinks can be remedied by increasing the number of genera. He finds that *Cotyledon,* a South African genus, is to be excluded from American groups, and that, in place of it, *Echeveria* is to be restored. To the latter most of the Mexican species are referred. A new genus, *Dudleya,* is proposed for certain species from the west coast of North America.

Wilfred H. Osgood,
Secretary.

THE PHILOSOPHICAL SOCIETY OF WASHINGTON.

The 581st meeting was held February 27, 1904. The evening was devoted to aeronautical subjects.

Dr. A. F. Zahm read a paper on 'Atmospheric Friction with Special Reference to Aeronautics,' giving a partial account of one of the researches on air resistance which he has been conducting the past three years, at the Catholic University of America. His measurements show that the skin friction R, of a thin material plane of length l, and speed v moving through still air, is expressed by an equation of the form $R = al^m v^n$, in which a, m, n are numerical constants for all speeds up to the limit of experiment, which was about 25 miles an hour. For a strip of the plane one foot wide and l feet long moving v miles an hour, the above formula gives $R = 0.0000336 l^{0.93} v^{1.85}$,—$R$ being in pounds. Applying this equation to practical problems he showed that the element of skin friction is

* An illustrated account of the birds of Laysan has been published by W. K. Fisher, Bull. U. S. Fish Comm. for 1903, pp. 1–39, pls. 1–10.

as formidable an obstacle in aeronautics as in marine navigation, where it is one of the chief resistances. To overcome the friction on the surface necessary to support 100 pounds under practical conditions of flight requires about one horse power on a tow line, or nearly two horse power applied by propellers.

Mr. Charles M. Manly, of the Smithsonian Institution, presented the 'History and Present Status of Aeronautics.' He traced briefly the development of balloons for a century till Renard and Krebs in 1884 made a flight of two and one half miles, returning to their starting point; and he gave the data of the machines and flights of Santos Dumont, von Zepplin, Le Baudy brothers and others. The highest speed reported is twenty-three miles per hour.

The development of aeroplanes was traced in more detail. Models heavier than the air were flown in 1842 and 1878. In 1868 Stringfellow built a model with steam-engine and boiler carried by the superposed planes suggested by Wenham in 1866, though this never flew. In 1891 Professor Langley, and about the same time Maxim in England, published the results of systematic experiments on the principles underlying the subject. Some years later successful flights were made by machines with motors of over one horse power. In 1903 Mr. Langley's aerodrome, with a 52 horse-power gasoline-engine weighing with cooling water and all accessories only 200 pounds, and carrying one passenger, was launched. Accidents to the launching devices prevented a successful flight; but the speaker had no doubt of the ability of the machine to fly. Reference was made to the reported success of the Wright Bros. in North Carolina, but full data are not yet available; to the remarkable invention of Mr. A. G. Bell whose tetrahedral kites promise to furnish supporting planes, the weight of which increases little faster than the area; and to the experiments of Lilienthal and others with gliding machines.

In the discussion that followed Professor Langley emphasized the value of Dr. Zahm's measurements, of Mr. Manly's work in reducing the weight of the motor, and of Mr. Bell's novel supporting planes. Professor Bell told of the curious history of the idea of air *ships*, and said Mr. Manly was the first to risk himself on a power-driven aeroplane. Others spoke of recent English theoretical work, and of the attitude of the U. S. Patent Office which, though granting nearly 300 patents for structures involving a gas bag, has held that aeroplane devices, not having been shown to be operative, are not entitled to protection by a patent.

CHARLES K. WEAD,
Secretary.

THE NORTHEASTERN SECTION OF THE AMERICAN CHEMICAL SOCIETY.

THE fiftieth regular meeting of the section was held in Huntington Hall, Massachusetts Institute of Technology, Boston, Thursday evening, February 25, with President W. H. Walker in the chair. About 900 members and guests were present.

Mr. E. Stütz, vice-president of the Goldschmidt Thermit Co., gave an address on 'Aluminothermics, and their Applications to Engineering and Metallurgy.' Mr. Stütz described the various uses of thermit, the trade name given to a mixture of powdered aluminum and the oxides of various metals, in which when ignited a reaction is brought about, whereby a great amount of heat is generated, oxide of aluminum is formed, and the metal set free from its oxide is obtained in a molten condition. Large masses of pure chromium, manganese and other metals were shown, and a demonstration of the preparation of pure nickel from the oxide was made. The principal use of thermit at present is in the formation of iron from a mixture of powdered aluminum and oxide of iron, and the application of this to various forms of welding. Mr. Stütz demonstrated the method by burning a hole through a plate of wrought iron three fourths inch thick, by allowing a stream of molten iron as formed by the reaction to fall on the plate, also by welding a nine-inch girder rail, by welding iron to casting to illustrate a method of repairing flaws, by welding iron pipe, and other experiments.

A number of lantern slides were also shown,

illustrating the practical methods of using thermit in welding electric car rails in place, repairing broken stern posts and shafts in large steamers, etc.

Arthur M. Comey,
Secretary.

DISCUSSION AND CORRESPONDENCE.

CONVOCATION WEEK.

In the multitude of counselors there is said to be safety, and it may be hoped that a sound conclusion may be evolved from the widely differing views which are finding expression in the columns of Science.

In my own opinion, as in the opinion of some others who have already written, it has been a mistake to change the time of the meeting of the American Association from summer to winter. The American Association is and should be a popular association. It seeks to include in its membership not alone professional workers in science, but the wider public who have a more or less intelligent interest in the results of science. It appeals not only to the professors in the universities and colleges, but also to the great army of teachers in the secondary schools. It draws its members not from one district, but from all parts of the continent. Now I think that the time for the meeting of such an association is the summer vacation. In our winter, long journeys are apt to be more or less uncomfortable, and trains are not infrequently seriously delayed by snow. It is impracticable for the colleges and schools to arrange their work so as to allow a long vacation at Christmas time; and part of the Christmas vacation is and ought to be devoted by most of the students of science in the country to the claims of home and family. Both the inclemency of the weather and the shortness of the time at our disposal render it impossible to have excursions in connection with a Christmas meeting; and, in the American Association, as in its illustrious prototype, the British Association, the excursions are a very valuable part of the privileges offered by the meeting. Any one who has attended a meeting of the British Association in recent years, studied the elaborate guide-book for the locality prepared by the local committee, and availed himself of the opportunities of excursions adapted to his own tastes and studies, whether he be a geologist or a naturalist or an archeologist or an engineer, will appreciate how valuable this part of the work of such an association may be made. These excursions are valuable alike to the professional scientist and to the amateur.

While the Christmas vacation seems to me a very unsuitable time for the meetings of the American Association, it is an excellent time for the meetings of the numerous associations of more restricted membership and more definite scope. In several cases these narrow professional societies have already divided themselves into sections distributed in different regions of the country. The members of a local section of such a society can easily get together in the Christmas vacation. The journeys required are comparatively short, and the time at their disposal is amply sufficient. Their program does not aim to cover all science; they are not required to do anything in the way of popularization; they can meet for a few days of quiet, earnest work in the discussion of the papers of a homogeneous program; they can find relief from the serious work of the sessions in a dinner or a smoker or both; and, when they have done their scientific work, and enjoyed their friendly greetings and renewal of cherished associations, they can go home in season for the opening of the winter term in the institutions with which they are connected.

It was said by many that the large attendance and the great interest in the Washington meeting were the vindication of the plan of a winter session of the American Association. It must be remembered, however, that Washington is altogether an exceptional city. In the number of resident scientific men, and in the variety of museums and other indoor attractions for students of science, professional or amateur, Washington stands unrivaled. The success of the Washington meeting was due to the exceptional character of the locality. The comparative failure of the St. Louis meeting affords more nearly a just criterion of the expediency of the plan.